

testaceous, wider behind than in front; antennæ fuscous, the basal joints testaceous; palpi testaceous; mandibles nearly straight, and projecting very slightly, giving a triangular outline to the front of the head. Thorax with anterior angles acute and posterior obtuse*; sides with a narrow raised edge and slightly sinuate behind, coarsely punctate over the whole surface, dorsal line faintly observable on the disk, and a considerable elongate fovea near each of the posterior angles. Scutellum small, transverse and impunctate. Elytra punctate-striate, most closely and deeply at the apex, the punctures in the striæ small and closely placed together, the interstices flat and thickly covered with a fine granulose punctuation; apex deeply excised, so much so as to remind one of the apex of the elytra in the male *Silpha sinuata*. Under side pretty coarsely punctate, except on the segments of the abdomen, which are only finely punctate. Legs testaceous.

V.—*Further Gleanings in British Conchology.*

By J. GWYN JEFFREYS, Esq., F.R.S.

[Continued from vol. ii. p. 133.]

[With a Plate.]

I LAST autumn paid a short visit to my friend Dr. Lukis at Guernsey, and through his kindness became better acquainted with the Mollusca of the Channel Isles; and having received a consignment of Zetland shells from Mr. Barlee, and several valuable communications from the Rev. Mr. Norman, Mr. Hyndman, Mr. Lukis, Mr. Wm. Thompson, the Rev. Leonard Jenyns, Mrs. Collings, Mr. Wm. Clark, Mr. Alder, Mr. M'Andrew, Capt. Bedford, Mr. Bean, Mr. Pickering, Dr. Halley, Mr. Webster, and last, but not least, my zealous and able collaborateurs, Dr. Lukis and Mr. Barlee, I am enabled to make another contribution to British Conchology. Some of the facts which I have thus collected, and now present to my readers, will I think be found to possess not a little interest in a geological as well as a conchological point of view, and to show the intimate connexion which exists between the two sciences, while others have an important bearing on the difficult and unsettled question of geographical distribution.

I have also had opportunities of examining typical collections

* In his synopsis of the characters of this genus, Prof. Lacordaire (*Genera*, i. p. 301) has added a generic character to those given originally by the Count Dejean, which I do not think warranted, and which should be withdrawn, viz. that the posterior angles of the thorax are rounded. They are usually obtuse, and sometimes rounded, but not always so.

of Möller and Mörch from Greenland and of Lovén from Norway, in which nearly all the species (although sometimes disguised under different names from ours) are undistinguishable from those of this country, or are at most only local varieties. I have on another occasion pointed out the hindrance caused to science, and especially to Palæontological Geology, by the reduplication of names for the same species; and until the errors are rectified and a complete concordance established, it is evident that any catalogues, from which the relative proportions of fossil and recent species are deduced, cannot be of much value. In another respect, too, such catalogues are defective, viz. in assuming that all the recent species which exist in any given area are not also found in a fossil state. Such is the case with Philippi's catalogues (in his work on the Sicilian Testacea and his papers in Wiegmann's Archives), to which, although accurate to a certain extent, additions are continually being made, so as materially to alter the relative proportions. It is most probable that every species which he has described as now inhabiting the coasts of lower Italy will eventually be discovered to have also had its existence in the Tertiary epoch, and perhaps *vice versâ*. The old adage "*De non apparentibus et non existentibus eadem est ratio*" surely does not apply to the science of Natural History.

I will say a few words as to the way in which I believe many exotic species have been introduced into collections and catalogues of British shells. Whilst enjoying last autumn the hospitality of the Rev. Mr. and Mrs. Collings at the seigneurie in Serk, I witnessed, with a telescope from the tower, a scene which I shall not soon forget. It was that of at least 200 excursionists, who had landed from Guernsey steamers on the little Isle of Herm, and were busily engaged in picking up shells on the famous beach there,—some of them on their hands and knees, others in various recumbent attitudes, and all provided with bags and baskets. I was informed that most of the shells so collected were used in the manufacture of ornamental articles. These collectors were probably careless about the localities whence their specimens were procured; and thus, from the mixture of native shells with others from foreign countries of a more attractive form or colour, has arisen some of the confusion which exists in many collections purporting to be entirely of British species. For instance, in Mr. Macculloch's cabinet of shells from the Channel Isles, I observed some well-known West Indian species which had been procured in the above manner. Some spurious species have doubtless also been foisted on conchologists by design as well as inadvertence. Maravigna (in his '*Mémoires pour servir à l'Histoire Naturelle de la Sicile*') states that he had

reason to believe Philippi was in several instances deceived by fishermen; and in the 'History of the British Mollusca' it is stated (as I believe, with truth) that Montagu and Turton were often similarly misled. I do not think that many spurious species have been introduced by means of wrecked ships, though perhaps a small percentage may be thus accounted for. Mr. Hyndman, in his Report last year to the British Association, of the proceedings of the Belfast Dredging Committee, states that dead specimens of *Cypræa moneta* had been frequently found on the shore near Bangor, county Down, and he adds that there was a tradition that a ship engaged in the slave trade was wrecked there. Such cases are, however, I apprehend, very rare.

I am indebted to Dr. Lukis and Mrs. Collings for the accurate illustrations which accompany this paper; the former as to the shells, and the latter as to the lingual ribbands or "tongues" of some of the Gasteropods. The representation of the hinge and teeth of *Limopsis pellucida*, which is altogether only $\frac{1}{40}$ th of an inch in length, and of the tongue of *Euomphalus nitidissimus*, an animal scarcely half a line in diameter, may justly be reckoned among triumphs of microscopic art.

Acephala Lamellibranchiata.

Teredo Norvagica, Forbes & Hanl. Brit. Moll. vol. i. p. 66. Weymouth (Mr. Thompson); in a log of wood at Penzance (Rev. Mr. Norman).

T. megotara, i. 77. Mr. Norman informs me that Mr. Frederick Burton obtained this species last year, from wood thrown up near Newhaven.

T. malleolus, i. 84. In cork, Falmouth (Rev. Mr. Norman).

Pholas crispata, i. 114. Weymouth, by Mr. Metcalfe (Mr. Thompson); and Mr. Norman says that large valves, fully 3 inches in length, are frequently thrown up on the shore at Hunstanton in Norfolk.

P. candida, i. 117. In the decayed wood of a submarine forest at Hunstanton; very abundant (Rev. Mr. Norman).

Mya arenaria, i. 168. Weymouth, by Mr. Metcalfe (Mr. Thompson).

Sphænia Binghami, i. 190. A shell, sent by Professor Lovén to Mr. Alder as "*Mya Swainsonii*," and forwarded by the latter to me for examination, belongs to this species, and not to the young of *Mya arenaria*, which Turton described under the name of *Sphenia Swainsoni*.

Neæra cuspidata, i. 195. Tiberi, in his recent pamphlet entitled "Descrizione di alcuni nuovi Testacei viventi nel Mediterraneo," has separated the *Corbula cuspidata* of Philippi from our ordinary form, under the name of *Neæra renovata*. Both inhabit the Mediterranean. The first is thinner and more slender than the last, and it

has the rostrum much more produced; the posterior lateral tooth being simple in the right valve of the one, and double in that of the other. Brocchi, in his 'Conchiologia Fossile Subapennina' (p. 515), mentions a specimen which had a primary as well as two lateral teeth.

Thracia villosiuscula, i. 224. Weymouth (*Mr. Thompson*).

T. pubescens, i. 226. Weymouth (*Mr. Thompson*).

T. distorta, i. 231. In rock-pools at Arran, N. B., and Bantry (*Rev. Mr. Norman*).

Diodonta fragilis, i. 284. *Mr. Thompson* says he found a live specimen of this local shell at Weymouth in 1855.

Tellina pygmæa, i. 295. Herm (*Rev. Mr. Norman*); Guernsey (*J. G. J.*).

Syndosmya prismatica, i. 321. Guernsey (*Rev. Mr. Norman & J. G. J.*).

S. tenuis, i. 323. Guernsey (*Mr. Edgar Macculloch*); Seaford (*Rev. Mr. Norman*).

Scrobicularia piperata, i. 326. Weymouth and Southport (*Mr. Thompson*); Hunstanton (*Rev. Mr. Norman*).

Ervilia castanea, i. 341. Herm (*Mr. Macculloch*).

Astarte crebricostata, i. 456. Forbes and Hanley distinguish this from *A. sulcata* by its having 30 or more ribs, instead of from 20 to 30, which the latter species possesses, and by "the posterior cessation" of these ribs. I have recent specimens from Zetland which show 36 ribs, and others from Norway, which Mr. M'Andrew obtained and obligingly gave me, showing as many as 42 ribs; but the number of ribs varies much in specimens from different localities, as well as the comparative want or cessation of them on the posterior side, and I must confess that I cannot see more than a varietal difference between the two so-called species.

A. triangularis, i. 467. Clyde district (*Rev. Mr. Norman*).

Cardium. The young of *C. echinatum*, as well as of *C. punctatum* and other species, have a remarkable slenderness and obliquity of outline, which in the adult becomes more portly, like

"the Justice,

In fair round belly with good capon lined."

C. aculeatum, ii. 4. Weymouth (*Mr. Thompson*).

C. punctatum. *C. nodosum*, ii. 22. Clyde district (*Rev. Mr. Norman*).

C. pygmæum, ii. 29. Herm and Serk.

C. papillosum. I found a single valve on the beach at Herm, within a few minutes of my visiting it; so that it would appear not to be uncommon on that part of our coast.

Clausina Croulinensis. The largest individual I have of this species, and which came from the Shetlands, measures in length nearly one-eighth, and in breadth one-tenth, of an inch. In fresh and young specimens a minute spiculum or horn-like process is seen to project from the right beak in a line with the shell. I should not be surprised if it proved to be the young of the *Axinus Sarsii* of Lovén,

Ann. & Mag. N. Hist. Ser. 3. Vol. iii.

which is not angulated like *Cryptodon flexuosum*, and has no vestige of a tooth, although the shell is three times as large.

Montacuta ferruginosa, ii. 72. Bantry (Rev. Mr. Norman).

M. bidentata, ii. 75. Hunstanton and Falmouth (Rev. Mr. Norman). To this species belongs a shell which was sent by Professor Lovén to Mr. Alder, and forwarded by the latter to me for examination, under the name of "*Mesodesma exiguum*;" and it seems to agree with Lovén's description of the last-named species.

M. substriata, ii. 77. Weymouth (Mr. Thompson).

Kellia lactea. *Tellimya lactea*, Brown, Ill. Br. Conch. p. 106. pl. 42. f. 10, 11. *K. suborbicularis*, B. M. ii. 87. pl. 18. f. 9 (not 9^a or 9^b). *K. lactea*, Lovén, p. 44. *K. Cailliaudi*, Recluz in Journ. de Conch. t. vi. p. 340. pl. 12. f. 4, 5. I believe this is a distinct species from *K. suborbicularis*, being of a more ovate form, with the front margin somewhat compressed, and the form and position of the hinge, teeth, and ligament being different. It may be the variety noticed by Montagu. I have given a figure of the hinge and teeth in Pl. II. fig. 1, which may be compared with that of *K. suborbicularis* in the 'British Mollusca,' to show the distinction between them in this respect, the other figures in the same work admirably characterizing their respective forms. This species is not so common as *K. suborbicularis*; but both of them occur together on all parts of our coast from the Channel Isles to Zetland. M. Cailliaud of Nantes, who first discovered it in France, identified my shells as Recluz's species; and I also found specimens this autumn on the coast of Normandy. Mr. M'Andrew has taken it on the Atlantic coast of Spain; and I have seen a specimen which was received by Mr. Alder from Professor Lovén as his *K. lactea*.

K. rubra, ii. 94. Weymouth (Mr. Thompson).

Lepton squamosum, ii. 98. Falmouth (Rev. Mr. Norman). I have also taken it on the coast of Normandy with other shells hitherto considered to be confined to this country, and which will probably be noticed by M. Petit in the 'Journal de Conchyliologie.'

L. Clarkiæ, iv. 255. Zetland (Mr. Barlee).

L. sulcatulum, n. s. Pl. II. fig. 2 a-g.

Testa subrotunda, convexiuscula, nitida, pellucida, alba, sulcis confertis concentricis insculpta; margine antico aliquando (præsertim in adultis) sinuato; umbonibus prominulis, calyculatis, glabris; dentibus, in valvula dextra duo lateralibus validis approximatis, in valvula sinistra uno cardinali et duo lateralibus utrinque approximantibus; ligamento (uti in congeneribus) interno, fovea centrali triangulari, recepto; long. $\frac{1}{15}$ unc., lat. fere eadem.

This new and exquisitely beautiful species occurred to me rather plentifully in dredged sand and washings of corallines from the sublittoral zone at Guernsey. I also noticed it at Paris among some minute shells from Sardinia which were submitted to my inspection, as well as in Mr. M'Andrew's cabinet from Orotava and Lancerote in the Canaries; so that it appears to have a wide range. Mr. Clark justly remarks that it is allied to *L. Clarkiæ*. In form and sculpture

it has some analogies with the genus *Codakia* of Scopoli. Even this tiny shell is sometimes found to have been drilled by one of the canaliferous mollusks.

Galeomma Turtoni, ii. 105. Weymouth, in *Eschara foliacea* (Mr. Thompson).

Sphærium calyculatum. *Cyclas calyculata*, ii. 115. Plymouth (Rev. Mr. Norman). Scopoli's generic name ought, I think, to be retained, as it was indicated by him, so long ago as 1777, with sufficient precision, and the type which he gave (*Tellina cornea* of Linnaeus) is unmistakeable. I believe it is not generally known that the *Sphæria* and *Pisidia* possess the power of swimming and floating on the under-surface of the water. M. Moquin-Tandon, indeed, in his admirable work on the Land and Freshwater Mollusca of France, says, with regard to the *Cyclades*, "Ces mollusques rampent très bien sur les plantes aquatiques et même à la surface de l'eau, au moins pendant leur jeunesse." And he says, with regard to the *Pisidia*, "Les Pisidies rampent avec facilité; elles exécutent même des espèces de sauts. On assure que, dans certaines circonstances, elles se tiennent à la surface de l'eau et peuvent y nager." And M. Baudon, in his excellent Monograph on the French *Pisidia*, gives an interesting account of the mode of progression adopted by the *Pisidium*. But I think it will be also interesting to have Dr. Lukis's account of the natatory feats of the *Sphærium calyculatum*, as well as of a curious phænomenon resulting from the passage of a continuous stream of water through one or both of its siphonal tubes. He says, in a letter to me dated the 27th of October last, "I placed a number in a small fish-globe in clear water taken from the sluggish stream in which they were captured. In a short time they commenced crawling about and actually ascending the slippery concave glass. In a few days a considerable number of the fry had been cast, which proved far more active than their parents, readily climbing the sides of the globe, and rarely missing their footing, while the adults made many ineffectual attempts; but both fry and adults, when they reach the edge of the water, take to the surface easily, and creep along slowly and apparently cautiously, as if in search of some floating substance, near which they will rest for hours. The exerted foot moves, during this under-surface progression, by a gentle vermicular action, the siphons being at the same time protruded. The foot during repose is usually retracted, and does not seem necessary for mere floating purposes. I have not been able to detect any filament, as in *Kellia*," &c. And he adds, "An interesting little scene occurred in the globe the other evening. Several individuals had reached a few leaves and hanging roots of minute water-plants which floated in the centre of the globe, down the stems of which three or four had crept to a depth of about an inch and a half. There they reposed: but they were not absolutely motionless, for to my surprise the whole group, plants and all, were dreamily enjoying the delights of a short, but long-continued, rotation. Round and round they all together went,—a little world revolving from some unseen cause, and leaving this for me to conjecture. At first I thought some mi-

nute water-insect had found its way unbidden into the globe, and was thus illustrating, like some learned lecturer to his sleeping audience, the laws of planetary motions. But no such lecturer was there; yet, as the revolution brought two of the audience closer under inspection, I observed their siphons to be curved exactly in the opposite direction to the line of motion. Here was a solution, at once, of the nymph-like *σπρόβιλος*, which was evidently due to the recoil consequent upon the circulation and expulsion of the water through the siphons. The fortuitous position of the two individuals and the combined action of their expulsive tubes may not occur again; but the whole incident was so interesting and remarkable, that I could not help recording it. The fry are growing rapidly; and I opine the amount of exercise they indulge in is conducive to their health. I have observed the *Eulima distorta*, *Rissoa parva* and *cingillus*, as well as the *Odostomia* and *Jeffreysia*, ascend to the edge of a basin and creep along the under-surface of the water, in the same manner as the *Lymnæadæ*. But it is singular that bivalves should imitate their less unwieldy molluscan brethren in this seemingly unsuitable mode of progression." In another letter he says, "Sometimes a single individual will suspend itself to a little bit of the stem of the *Lemna*, and whirl quite alone for hours, even rapidly—say fifteen to twenty revolutions in a minute. The quantity of weed in the globe was very small." And in a subsequent letter he goes on to say, "The young are far more active than the parents. I do not perceive their siphons to be ever exerted, while this is almost constantly the habit of the older ones. They all continue to climb the glass globe, and rather more so in the evening, probably preferring to roam in the dark. I have had a fresh supply of about half-a-dozen, which, soon after being immersed, began an inspection of their new domain, and continued for a day or two more restless than the others. On climbing the glass, the front margin of the valves is applied to it, and at the same time both the foot and the siphons are exerted. The foot being extended to its full length, its extremity is cautiously pressed against the glass, and after a short pause the upward movement of the body commences, which is the work of a second of time; then another short pause, after which the front margin of the valves and the point of the foot are again applied cautiously to the glass, and the foot is again protruded to repeat the same process. When the edge of the water is reached, the pauses are longer, and it is necessary for the creature to be doubly cautious, for here is the point of greatest difficulty. However, the foot is conveyed horizontally along the under surface of the water, which appears to recede partially from it. On examining it with a lens, the foot is distinctly seen to have an undulating action on the surface, as well as an irregular and imperfect contraction and elongation along its whole extent; but it is never quite retracted, excepting when its base and the front margin of the valves are in contact with some floating weed which is capable of supporting the whole. Thus this elegant shell traverses the still surface. But it is most curious to see it descending the thread-like stems of the *Lemna*, or some assemblage of these delicate

fibres—even a single stem is quite sufficient; and if the shell is free from any other contact, it immediately begins its rotatory movement. A single shell, thus suspended, revolves upon its axis in a direction which is most frequently from right to left of the observer, or in the opposite direction from that of a teetotum when made to spin by the fingers of the right hand. I have suspended single threads to circular pieces of cork in the water, but the stems of the *Lemna* are preferred. *C. cornea* is much less active or inclined to ascend the glass; in fact, I have not yet seen it accomplish the feat of its congener. Several of the *C. calyculata* will remain among the stems of the duckweed for hours perfectly inactive, with closed valves, as if sleeping or resting after their previous fatigue. When the valves are pressed against the glass while ascending, there seems to be a fulness about the base of the foot, as if the mantle served for adhesion to the glass.” Dr. Lukis now informs me that he has detected the byssal filament in *Sph. calyculatum*. He says, “I have this morning (16th Dec.) watched one, which had reached the surface, *spin its filament*, and descend to half an inch below the surface, where it remained suspended for some time. It occupied three hours in spinning this short thread. I think it consists of more than a single filament, for some minute particles, which were floating in the water, became entangled in it. The surface of the water was, again, depressed or cupped.” And he concludes by saying that he found the number of the fibres varies from one to at least four, which in one instance were far apart, the siphons and foot being at the same time exposed; and he adds that the animal has the power of raising itself by means of this byssus again to the surface after having been suspended below it for some time. The filaments appeared not to exceed half an inch in length, and rarely more than one thread was distinctly visible.

Pisidium. Having examined the original and typical specimens of Mr. Jenyns, which he most obligingly sent me for that purpose, and being aided by a critical investigation of the species which I have carried on for very many years in this country, as well as in France, Germany, and Italy, I am inclined to reduce all the British species to the following: viz. 1. *pusillum* (including *obtusale*); 2. *nitidum*; 3. *roseum*; 4. *Henslowianum* (including *pulchellum* and *cinereum*, the types of which last I have also examined, through the kindness of Mr. Alder); and 5. *ammicum*. The variation of form, striation, and comparative solidity is unquestionably greater among freshwater than marine shells; and it is probably owing to the different nature and qualities of the fluid which they inhabit and from which their materials are secreted.

P. pusillum, var. *P. obtusale* (teste Jenyns), ii. 120. Clevedon (Rev. Mr. Norman); Serk (*J. G. J.*). I have never met with this variety in company with the typical form. Its habits appear to be more active, owing perhaps to the difference of the water and localities in which it is found.

Ditto (typical form), ii. 123. A very fine variety, of a paler colour, occurred to me some time ago in the neighbourhood of Llanelly, Carmarthenshire; and Mr. Bean has lately sent me the same variety

from Scarborough. Judging from the description and figure given by Poli in his 'Testacea utriusque Siciliæ,' t. i. p. 65. pl. 16. f. 1, I should say that his *P. Casertanum* ought to be referred to this species, and not to *P. Henslowianum* or *pulchellum*, as M. Baudon has supposed. Poli did not notice any other species. There being a difference of opinion on this point (probably arising from the description not being sufficiently explicit for identification of the species), it would not, in my opinion, be worth while to substitute the local name of *Casertanum* for either of these species, which are so well known by their present names.

Pisidium nitidum, ii. 126. Yatton, Somerset (*Rev. Mr. Norman*); Serk, with the last and two next species. It appears to be generally diffused throughout Great Britain and Ireland, but not to be so gregarious, or to occur in such numbers, as the last species.

P. roseum, Scholtz, Schlesien's Land- und Wasser-Mollusken, p. 140. *P. pulchellum*, var. δ , Jen. p. 18. pl. 21. f. 4, 5. *P. Gassiessianum*, Dupuy, Moll. terr. et d'eau douce en France, p. 685. t. 30. f. 7. This species differs from any of its congeners in the colour of the animal, from which the name given to it by Scholtz is derived, as well as in its gibbous shell, and the front or ventral margin being much compressed. It is found, but in comparative rarity, together with *P. nitidum* and *Henslowianum* (var. *pulchellum*), so that it cannot be a local variety of either of these species; and the position of its beaks, which is nearly terminal, will at once serve to distinguish it from *P. pusillum* or any of its varieties. I have taken it in many parts of England and Wales, as far north as Nottinghamshire; and I observed it, in 1843, in a pond by the road-side between Bonn and Poppelsdorff in the Rhine district. A comparison of Mr. Jenyns's typical specimen of *P. pulchellum* var. δ . with this species has satisfied me that they are the same. I have added a representation of it in Pl. II. f. 3 a-c. It was not without considerable hesitation that I adopted Scholtz's name of *roseum* for this species, because in a Supplement to the second edition of his work, which was published in 1853, he has considered it to be a variety of the *P. fontinale* of Pfeiffer (our *P. pusillum*); but the peculiar and constant colour of the animal appears to form a good distinctive mark, and Scholtz has not otherwise characterized any of the *Pisidia* with sufficient accuracy.

P. Henslowianum var. *pulchellum*, ii. 128. Guernsey (*Dr. Lukis*).

Ditto (typical form), ii. 131. Ferry Hill, co. Durham (*Rev. Mr. Norman*).

The *P. Recluzianum* of Baudon's monograph, p. 53. pl. 5. f. D, which is stated to have been found at Belfast, appears, from the description and figure given by him, to be the *Turtonia minuta*. He even states the colour of the shell to be "flavo-violacea," which is precisely that of *T. minuta*. Mr. Hyndman says, as to this species, "Abundant between tide-marks. Found in great quantity in the stomachs of mullet taken in the Harbour near Belfast. In one fish taken in Larne Lough, and the contents of the stomach given me by W. Darragh, Curator to the Belfast Museum, I estimated 35,000 of

these little shells." It is equally abundant in the Channel Isles. The original species (*P. Recluzianum*) seems to have been founded by M. Bourguignat on young specimens of *P. Henslowianum* (var. *pulchellum*) from Boulogne, and is described and figured in the 'Journal de Conchyliologie,' t. iii. p. 174. pl. 8. f. 8 a-e.

Mytilus Galloprovincialis, Lamarck, vi. (1) 126. I believe this to be a distinct species from *M. edulis* or any of its varieties, and that it may be readily distinguished by the compression and sharp angle of the anterior side, the more rounded outline of the basal margin (which in *M. edulis* is subquadrate), the beaks being more incurved, and especially by the prominence of the posterior or byssal margin. It also attains a much larger size; a specimen which I noticed in the collection of M. Deshayes, from Toulon, measuring about five inches in length. Mr. Barlee's specimen of *M. edulis*, which is recorded in the 'British Mollusca' as measuring eight inches and a half in length, is a *Modiola modiolus*. Another characteristic mark, which I observed in Lamarck's typical specimen of *M. Galloprovincialis* at the Jardin des Plantes, and in all the other specimens which I have seen, is that the epidermis is more or less puckered, like what are called "crows'-feet," in some part or other of the shell. The *M. pellucidus* of Pennant and other English conchologists is most probably a variety of this species, and not of *M. edulis*; but I will not venture to restore Pennant's name, as he did not distinguish the species with sufficient precision. It is also probably the *M. dilatatus* of Gray, and the *M. subsaxatilis* of Williamson. It is not uncommon on our coasts; and I have some fine specimens from the Bristol Channel. A representation of this species will be found in Pl. II. fig. 4.

M. unguatus, Pl. II. fig. 5. Linn. Syst. Nat. p. 1157. Poli, Test. utr. Sic. t. ii. p. 208.

While I was at Serk with Dr. Lukis, we found in the Gouliot Caves there several specimens of this unquestionably distinct species, mixed with *M. edulis* and *M. Galloprovincialis*. These caves are completely uncovered by the sea once only in about eight or ten years, and are never accessible except at low spring tides, and even then for a very short time only; and the mussels were obtained by scraping the side of one of the outer entrances which was under water. The tide sometimes rises on that coast to a height of 32 feet. The specimens in my possession exactly correspond with the description given by Linnæus in his 'Systema Naturæ,' and which is as follows:—" *M. testa lævi, subcurvata: margine posteriori inflexo, cardine terminali bidentato.*" And in the 'Mus. Lud. Ulr.' p. 541, he says, "*Testa rudis, fragilis, livida, striata transversim quasi ex lineis imbricatis. Sutura postica linea recta excurrit ultra apicem obtusum. Cardio rima longitudine suturæ eique parallela. Par testarum distinctarum, in plano juxta se positarum, refert ungulas pecoris binas medio a se invicem dehiscentes et basi divaricatas.*" And in his note 136* he adds, "*Valvulæ valde convexæ. Nates distantes acutæ. Cardio apicis dentibus 2, 3, s. 4, notatus.*" The localities assigned by Linnæus to this species are Southern Europe and the Cape of Good Hope; but I suspect that the shells from the last-named locality may belong to

a different species. The colour of the animal differs from that of *M. edulis* and *M. Galloprovincialis* in being bright yellow instead of brown; and the shells are at a glance equally distinguishable by the anterior side being extremely gibbous, the posterior or byssal margin being straight or inflected and umbilicated, the want of a dorsal angle, the pointed extremities, and also by the oblique slope on each side of the lower or basal margins to a point, causing the fanciful but striking resemblance to a bullock's hoof when the valves are placed side by side. The colour of the shell is purplish blue, the epidermis being olive-brown and highly iridescent. The size of our largest specimen is four inches and a half in length, and two and a quarter in breadth. In the Linnæan Collection two shells are still preserved; one of them being in a tin cradle-shaped box, marked on the lid "*Mytilus unguatus*," in Linnæus's own handwriting; the other being loose in the same drawer. Both of these shells have on the inside of one of the valves the number "216" in the same handwriting; and this number corresponds with that under which the species is described in the tenth edition of the '*Systema Naturæ*.' They agree with ours in every respect, except in being somewhat smaller. Dr. Lukis informs me that the "hoof" mussel is sometimes, but rarely, brought to the Guernsey market from a very large reef of rocks about twenty-five miles south of the island, and that such specimens are nearly as fine as those from the Gouliot Caves. The rediscovery of this long-lost Linnæan species is very interesting. None of the subsequent authors except Poli seem to have recognized it; and when they attempted to do so, they mistook other, and exotic, species for it. Since the above was written, Mr. Norman has sent me for examination some shells which he, and afterwards Mr. Webster, took at Hayle in Cornwall, and which clearly belong to this species, as well as a stunted specimen of the form or variety called *incurvatus*, found by Mr. Norman at the Land's-End.

Modiola tulipa, ii. 187. This forms a rude nest by agglutinating together small stones and bits of other shells, in the same manner as the *Limæ*; and when taken out, it floats on the surface, being either of less specific gravity than the water, or buoyed up by air-cells. I think this is a different species from the *M. tulipa* of Lamarck, which is exotic, and that the name "*radiata*," given to it by Mr. Hanley in Thorpe's '*British Marine Conchology*,' ought to be adopted for our shell. A large and dark-coloured variety has been taken by Mr. Norman, as well as myself, plentifully in Falmouth Harbour. Specimens of this variety attain sometimes the size of two inches and a quarter in length.

M. cuprea, n. s.

Testa ovato-trapezoidea, gibbosa, solidula, nitida, epidermide fulva prismatica, antice flava pilosa, vestita, subtus albida, rugis concentricis raris irregulariter notata; angulo transversali ex apicibus ad latus antierius oblique decurrente; umbonibus obtusis; lateribus, dorsali rectiusculo elevatiore antice rotundato, posteriori abrupte truncato, ventrali convexo subsinuato postice declivi, anteriori

quadrato; marginibus integris; bysso ex filis perpaucis curtis crassulis composito; long. $\frac{1}{6}$, lat. $\frac{1}{8}$ unc.

I have just received from Mr. Bean specimens of this pretty little *Modiola*. He says they were taken from the stomach of a Sanderling, which was shot on the north shore at Scarborough; they were mixed with the young of *Mytilus edulis* and *Littorina littoralis*. I regret that they reached me too late for illustration, my drawings being at the time in the engraver's hands. It somewhat resembles the fry of *Crenella nigra*, which is quite devoid of any longitudinal ribs or striæ; but the latter are of an oblong shape, and flatter, and they have no epidermis. *M. agglutinans*, or *vestita*, is also of a different shape, and not so tumid as this, although its epidermis is somewhat similar.

I much doubt the propriety of separating *Crenella* from *Modiola*, because the former is in its earliest stage of growth also quite smooth. It is true that some of the *Crenellæ* inhabit the tunic of Ascidians; but others (as *C. costulata*, *rhombea*, and *decussata*, as well as *C. discors* in its young state) are free. A few of the *Modiolæ* (as *M. tulipa* of British authors, and *M. agglutinans*) make and inhabit nests, while the rest are free. But these habits are not uniform, nor in my opinion sufficiently important in themselves to form a generic character. Mr. Stimpson, in his recent memoir on the New England shells, gives it as his opinion that *Modiola*, *Modiolaria*, and *Crenella* ought to be reunited to *Mytilus*, on the ground of the animals being the same in all, and of the differences which exist in species of these so-called genera being as great *inter se* as between the genera themselves. He also says that the British species of *Crenella*, which are found on the North American coast, do not possess the habit of burrowing in the tests of *Ascidia*.

Crenella costulata, ii. 205. Herm (Mr. Macculloch).

Nucula nitida, ii. 218. Dead valves are abundant in dredged sand from the Turbot Bank, Belfast Bay.

N. radiata, ii. 220. Weymouth (Mr. Thompson).

Arca tetragona, ii. 234. Abundant in crevices of the slate rocks at Bantry (Dr. Armstrong, Mr. Barlee, Rev. Mr. Norman, and J. G. J.).

Limopsis pellucida, n. s. Pl. II. fig. 6 a-d.

Testa ovata, ventricosa, nitida, pellucida, glabra, vix subauriculata, lineis incrementi conspicuis; umbonibus rectis, prominulis, obtusis; margine integro; cardine foveola media triangulari, subtusque denticulis 3 acutis, ad latus dextrum 11 et sinistrum 9 dentibus falcatis, instructo; ligamento foveolam cardinalem occupante; long. $\frac{1}{40}$, lat. $\frac{1}{30}$ unc.

I found two perfect specimens and a single valve of this almost microscopical shell in dredged sand from Guernsey; and the discovery is most interesting in adding a second species to the list of recent *Limopsides*. It appears to be adult, as the teeth are fully developed. It has no affinity with the fry of *Pectunculus Glyci-*

meris, which is quite of another shape, with the margin crenulate, and has only three or four tooth-like lamellæ on each side of the beak, besides wanting the central pit for the ligament. The *Pectunculus* (*Limopsis*) *minutus* of Philippi has an oblique form, much fewer teeth, more distinct auricles, and a crenulated margin; and the sculpture is very different. Our shell is more nearly allied to the *Arca aurita* of Brocchi; but in that species the form is also more oblique, and the surface is striated and sometimes decussated by the lines of growth. This sometimes resembles in appearance a minute *Ungulina*.

Lima subauriculata, ii. 263. Bantry (*Rev. Mr. Norman*). Lovén's specimens of *L. sulculus* agree with this in every respect; but I do not know his *L. subauriculata*. Judging from his description, it appears to be different from our species of the same name.

L. Loscombii, ii. 265. Mr. Hyndman, in his Report of the Belfast Dredging Committee for 1857, says, at page 224, that this species "makes a nest for itself, like *hians*, but often occurs without any. The animal swims vigorously through the water. The late James Rose Clealand, Esq., of Rathgael House, discovered this shell many years ago, off the Copeland Isles, and was aware of its making a nest."

L. hians, ii. 268. There appears to be a difference, but perhaps only a local or varietal one, between specimens taken in the west of Scotland and the south coast of England,—the former being larger and more swollen, and having the ribs and striæ much coarser, while adult shells from the latter locality are much smaller and flatter, and have a more delicate sculpture. Although the Scotch individuals form comfortable nests, those which inhabit the Channel Isles have none, but are found free under stones at low water.

Pecten furtivus, Lovén, p. 31. Specimens received by Mr. Alder and Mr. Hanley from Professor Lovén with this name, and which I have had an opportunity of examining, agree in every respect with our shells, and cannot be mistaken for any variety or modification of *P. striatus*.

P. aratus. *P. sulcatus*, Müll. Zool. Dan. Prodr. p. 248. no. 2995; Lov. p. 30. no. 228. *Ostrea arata*, Gmel. Linn. Syst. Nat. p. 3327. no. 60. A single valve, in a recent state, was taken by the dredge, under Mr. Barlee's directions, in from 60 to 80 fathoms, off the Skerries. Müller's original name of *sulcatus* having been pre-occupied by Born for a well-known Mediterranean species, Gmelin's name must be adopted for this.

Acephala Palliobranchiata, or Brachiopoda.

It is not improbable that this peculiar group of the *Mollusca* will have to be transferred to the *Molluscoidea*, and be assigned a place between the *Bryozoa* and *Tunicata*. No one can examine the *Argiopes* and *Lepraliæ* without being struck by the analogy between them in respect of the form, texture, and sculpture of their shells. Since the time of Montagu, the great tribe of the *Testacea* has lost several of its most important members in the Testaceous *Annelides*,

the *Cirrhopoda*, and *Foraminifera*; and there is now a prospect of its being deprived of its right arm, the *Brachiopoda*:—

“Singula de nobis anni prædantur euntes;
Eripuere jocos, Venerem, convivia, ludum;
Tendunt extorquere poemata.”

Terebratula capsula, n. s. Pl. II. fig. 7 *a*, *b*.

Testa subæquivalvis, rotundato-ovata, convexiuscula, lateribus utrinque compressis, nitida, fulva, punctis tuberculiformibus, irregulariter sparsis, vix confertis, notata; alis perbrevibus, rotundatis; rostris prominulis; foramine angusto; intus-sceletu seu deltidio nullo, in valvula superiore fovea triangulari demissa et dentibus 2 lateralibus validis lamelliformibus, in valvula inferiore denticulis 2 lateralibus cuspidatis, munita; margine integro; long. $\frac{1}{30}$, lat. $\frac{1}{40}$ unc.

Several specimens of the very minute Brachiopod noticed in my last paper have since occurred to me; and I have been thus enabled to ascertain its generic position. By sacrificing some of my specimens, I have succeeded in examining the interior structure of the shell; and I am satisfied that it belongs to *Terebratulina* of D'Orbigny, or to an allied subgenus of *Terebratula*, and not to *Argiope*. Mr. Norman's shell is of rather a more oval shape than any of my specimens; but they vary a little in this respect. It cannot be mistaken for the fry of *Terebratula caput-serpentis*, which is of a very different shape, and is inequivalve, besides having the peculiar dichotomous ribs which distinguish that species, in addition to the tuberculiform dots. Under a magnifying power of 100 diameters, the inner surface of *T. capsula* appears to be marked with very fine wavelike lines which converge towards the beaks. This shell being equivalve or nearly so, it may be a question whether it ought not to be placed in a new subgenus of *Terebratula*. Mr. Hyndman sent me this species from Belfast Bay as *Argiope cistellula*; and I have found it in old shells from the same locality, mixed with *Argiope cistellula*, which, however, occurs much less frequently there. I also discovered both species at Etretat, on the coast of Normandy, on stones which had been taken up in the fishermen's nets at a distance of four leagues from land, and at a depth of about 25 fathoms.

Argiope cistellula, ii. 361 (Megathyris), and iv. 257. I noticed a specimen of this shell, mixed with some of *A. Neapolitana*, which came from Sardinia; and I have reason to believe that Philippi confounded both species in his description and figures of *Orthis seminulum*. I have given in Pl. II. fig. 8 *a*, *b*, a representation of a young specimen of *A. cistellula* from Guernsey, to show the variation of form to which this species is subject.

[To be continued.]